ABSTRACT

In generating, transmitting, and receiving data signals, various forms of complex modulation formats are often used and the signals are most often processed as two component (I,Q) signals. Such

5   modulated signals are subject to a variety of impairments due to imperfections in the various elements in the transmission chain. For the large class of essentially linear impairment processes, the impairments may be removed with compensating filters, one filter being assigned to each impairment. In this invention, the generalized filter, a new class of two-channel filters for compensating impairments, is disclosed. Compared with previous two-channel filters, which are characterized by two

10   impulse responses, the generalized filter is characterized by four such impulse responses. This filter can simultaneously compensate a plurality of diverse impairments. A process for characterizing and designing a generalized filter is disclosed, along with a technique for efficiently computing the response of the filter to an arbitrary input sequence.